Gene editing with CRISPR, 3 credits

Code: P000131
Subject: Biology
Education cycle: Postgraduate level
Grading scale: Pass/fail
Language: English

Entry requirements Prospective students should be enrolled as a PhD student in Biology or an equivalent subject. Prior knowledge, both theoretical and practical, of genetics and molecular biology techniques such as PCR, plasmid cloning, and bacterial transformation is mandatory. This course is mainly intended for PhD students at SLU but postdoctoral researchers and PhD students from other universities are eligible to apply in case vacant seats are available.

Examination formats
Pass / Fail. To pass the course, course participants will need to attend
all the group sessions as well as submit a lab assignment.

Objectives
At the end of the course the student is expected to be able to

- Understand the theory behind CRISPR.
- Design their own CRISPR-based genome editing constructs.
- Analyze the results of their CRISPR-based experiments.
- Understand and analyze the various types of CRISPR-based genome editing tools available.
- Assess the benefits or disadvantages of a CRISPR-based experiment vs traditional tools for generating mutants.

Content

Since its discovery and adoption by the scientific community, CRISPR has become the most used tool to edit genomes of organisms, both for research and commercial purposes. This course aims to equip the students with a greater understanding of the details involved in designing and applying CRISPR in their projects, while expanding the knowledge base by providing examples and information about various CRISPR based genome editing tools currently available. The course features guest speakers who are experts and pioneers in CRISPR-enabled methods in plants and fungi. The course consists of a mixture of lectures, seminars, dry laborations and short home assignments as detailed in the course schedule.

Additional Information

The course is organized by Shamik Mazumdar and Simon Stael on behalf of the SLU graduate school Organism Biology. Maximum 20 students per course occasion. This course will require a good grasp of genetics and molecular biology. In case students are unsure of their previous knowledge, they can contact the organizers for further clarification on the level required.

Course literature will be provided in the form of talk slides, articles, and practical guide(s) for experimental design.